

## Electricity

**Note 1.** Electrical system energy losses are estimated as the difference between total energy consumed to generate electricity and the total energy content of electricity consumed by end users. Most of these losses occur at steam-electric power plants (conventional and nuclear) in the conversion of heat energy into mechanical energy to turn electric generators. This loss is a thermodynamically necessary feature of the steam-electric cycle. Part of the energy input-to-output losses are a result of imputing fossil energy equivalent inputs for hydroelectric and other energy sources, since there is no generally accepted practice for measuring these thermal conversion rates. In addition to conversion losses, other losses include power plant use of electricity, transmission and distribution of electricity from power plants to end-use consumers (also called “line-losses”), and unaccounted-for electricity. Total losses are allocated to the end-use sectors in proportion to each sector’s share of total electricity sales. Overall, approximately 67 percent of total energy input is lost in conversion; of electricity generated, approximately 5 percent is lost in plant use and 9 percent is lost in transmission and distribution. Calculated electrical energy transmission system losses may be less than actual losses, because primary consumption does not include the energy equivalent of electricity imports from Canada and Mexico, although they are included in electricity end use.

**Note 2.** Prior to 1985, electric utility statistics included data reported by institutions (such as universities) and military facilities that generated electricity primarily for their own use. Beginning in 1985, electric utility statistics exclude data for these facilities.

**Note 3.** Data on electric utility retail sales of electricity represent gross output of electricity (measured at the generator terminals) minus power plant use and transmission and distribution losses. Included in each end-use sector are the following: Commercial Sector—sales of electricity to businesses that generally require less than 1,000 kilowatts of service; Industrial Sector—sales of electricity to businesses that generally require more than 1,000 kilowatts of service; Residential Sector—sales of electricity to residences for household purposes; “Other” Sector—sales of electricity for public street and highway lighting, to public authorities, railways, and railroads, and interdepartmental sales.

**Note 4.** Electric utility net summer capacities were first collected on Form EIA-860 for 1984. Units not assigned a net summer capacity rating by the

utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capacity for each prime mover. To estimate net summer capacity for the years 1949 through 1984, two methods were used. For each prime mover except nuclear and “other,” net summer capacity estimates were calculated in two steps. First, the unit capacity values reported on Form EIA-860 and the unit start dates contained in the 1984 Generating Unit Reference File (GURF) were used to compute preliminary aggregate estimates of annual net summer capacity and installed nameplate capacity. These preliminary estimates were obtained by aggregating unit capacity values for all units in service during a given year. Next, the ratio of the preliminary capacity to nameplate estimate was computed for each year and multiplied by the previously published installed nameplate capacity values to produce the final estimates of net summer capacity. The net summer capacity data for nuclear and “other” units were used directly from the 1984 GURF for all years. Historical aggregates were then developed by using the unit start dates on the GURF.

Historical capacity has also been modified to estimate capacity based upon the operable definition. This was accomplished by assuming that non-nuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used. It should be noted that nonutility net summer capacities, which are not currently collected for nonutilities, are estimated based on installed nameplate capacity data.

**Table 8.1 Web Page:** <http://www.eia.doe.gov/fuelelectric.html>.

### Table 8.1 Sources

**Net Generation, Electric Utilities** • 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-2000—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 2001—EIA, Form EIA-906, “Power Plant Report.” **Net Generation, Independent Power Producers:** • 1989-1997—EIA, Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.” **Net Generation, Commercial:** Table 8.2c. **Net Generation, Industrial:** Table 8.2c. **Imports and Exports:** • 1949-September 1977—unpublished Federal Power Commission data. •

October 1977-1980—unpublished Economic Regulatory Administration (ERA) data. • 1981—Department of Energy (DOE), Office of Energy Emergency Operations, “Report on Electric Energy Exchanges with Canada and Mexico for Calendar Year 1981,” April 1982 (revised June 1982). • 1982 and 1983—DOE, ERA, Electricity Exchanges Across International Borders. • 1984-1986—DOE, ERA, Electricity Transactions Across International Borders. • 1987 and 1988—DOE, ERA, Form ERA-781R, “Annual Report of International Electrical Export/Import Data.” • 1989—DOE Fossil Energy, Form FE-781R, “Annual Report of International Electrical Export/Import Data.” • 1990-1998—Mexico’s Data: DOE, Fossil Fuels, Office of Fuels Programs, Form FE-781R, “Annual Report of International Electrical Export/Import Data.” Canada’s Data: National Energy Board of Canada (metered energy, firm and interruptible). • 1999 forward—EIA estimates based on preliminary data from DOE, Fossil Energy, and actual data from the National Energy Board of Canada. **Losses and Unaccounted For:** Calculated as the sum of total net generation and imports minus total end use and exports. **End Use:** Table 8.5.

#### **Table 8.2b Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.3b Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory

Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.4 Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.7b Sources**

• 1949-1983—Energy Information Administration, EIA, Form EIA-860A, “Annual Electric Generator Report—Utility” and predecessor forms. • 1984-1997—Energy Information Administration, EIA, Form EIA-860, “Annual Electric Generator Report” and predecessor forms. • 1998 forward EIA, Form EIA-860A, “Annual Electric Generator Report—Utility” and predecessor forms and EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility” and predecessor forms.

#### **Table 8.7c Sources**

• 1989-1997—Energy Information Administration (EIA), Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”